

CLAIMS

We claim:

1. A system for detecting the presence of an article comprising:
a transmitter for radiating a first electromagnetic signal at a
predetermined primary frequency;
a resonant tag secured to the article for generating a second
electromagnetic signal in response to receiving the first electromagnetic signal, the second
electromagnetic signal being at the primary frequency and at a predetermined secondary
frequency different from the primary frequency;
a receiver for receiving the second electromagnetic signal; and
a computer connected to an output of the receiver, said computer
processing the received second electromagnetic signal and generating an output signal when the
secondary frequency is detected in the second electromagnetic signal.
2. The system according to claim 1, wherein the tag comprises a first
resonant circuit for resonating at the primary frequency and a second resonant circuit for
resonating at the secondary frequency, the first and the second resonant circuits being
electromagnetically coupled.
3. The system according to claim 1, wherein the first electromagnetic
signal is pulse amplitude modulated.
4. The system according to claim 1, wherein the receiver also detects the
primary frequency and generates an output signal only when the primary and the secondary
frequencies are both detected.
5. The system according to claim 4, wherein the receiver is tuned
successively to the primary frequency and to the secondary frequency.

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6. The system according to claim 1, wherein the primary and the secondary frequencies are not harmonically related to each other.

7. The system according to claim 1, wherein the tag is of a passive type
5 which includes only inductive and capacitive elements.

8. A radio frequency system for determining the presence of information stored in a plurality of resonant circuits having different resonant frequencies, the system comprising:

10 a transmitter for radiating a first electromagnetic signal at a predetermined primary frequency;

a resonant tag, including the plurality of resonant circuits, each of the resonant circuits resonating at one of the different resonant frequencies, the tag receiving the first electromagnetic signal and generating a second electromagnetic signal in response to
15 receiving the first electromagnetic signal, the second electromagnetic signal comprising a plurality of secondary frequencies, each of the secondary frequencies corresponding to one of the resonant frequencies of the plurality of resonant circuits;

a receiver for receiving the second electromagnetic signal; and

a computer connected to the output of the receiver, said computer

20 processing the received second electromagnetic signal to detect the presence of the plurality of secondary frequencies and generating an output signal corresponding to the information.

25 9. The system according to claim 8, wherein the tag comprises a first resonant circuit and a plurality of second resonant circuits, each of the plurality of second resonant circuits being electromagnetically coupled to the first resonant circuit.

10. The system according to claim 8, wherein the first electromagnetic signal is pulse amplitude modulated.

30 11. The system according to claim 8, wherein the tag is of a passive type which includes only inductive and capacitive elements.

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12. A method for detecting the presence of an article comprising the steps of:
securing a resonant tag to the article;
transmitting a first electromagnetic signal at a predetermined primary
frequency;

5 generating a second electromagnetic signal in response to the resonant
tag receiving the first electromagnetic signal, the second electromagnetic signal being at the
primary frequency and at a predetermined secondary frequency different from the primary
frequency;

receiving the second electromagnetic signal; and

10 processing the received second electromagnetic signal and generating an
output signal when the secondary frequency is detected in the second electromagnetic signal.

13. The method of claim 12, wherein the first electromagnetic signal is pulse
amplitude modulated.

15 14. The method according to claim 12, further including the step of detecting
the primary frequency and generating an output signal only when the primary and the
secondary frequencies are both detected.

20 15. The method according to claim 14, wherein the primary frequency and
the secondary frequency are detected successively.

16. A method for determining the presence of information stored in a
plurality of resonant circuits having different resonant frequencies, comprising the steps of:

25 providing a tag including the plurality of resonant circuits;
radiating a first electromagnetic signal at a predetermined primary
frequency;

receiving the first electromagnetic signal in the resonant tag and
generating a second electromagnetic signal in response to receiving the first electromagnetic
30 signal, the second electromagnetic signal comprising a plurality of secondary frequencies, each
of the secondary frequencies corresponding to one of the resonant frequencies of the plurality
of resonant circuits;

receiving the second electromagnetic signal; and
processing the received second electromagnetic signal to detect the
presence of the plurality of secondary frequencies and generating an output signal
corresponding to the information.

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17. The method of claim 16, wherein the first electromagnetic signal is pulse
amplitude modulated.